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New *Acrocordia* and *Candelariella* records for Turkey

Zekiye Kocakaya[1] & Mehmet Gökhan Halıcı[2*]

[1]Department of Organic Agriculture, Boğazlıyan Vocational School, University of Bozok, 66400 Yozgat, Turkey

[2]University of Erciyes, Faculty of Science, Department of Biology, 38039 Kayseri, Turkey

* Correspondence to: *mghalici@gmail.com*

Abstract — *Acrocordia subglobosa*, *Candelariella faginea*, and *C. subdeflexa* are reported for the first time from Turkey. Comments on habitats, substrata, and key anatomical features are provided for each species.

Key words — *Ascomycota*, lichens, lichenized fungi, biodiversity

Introduction

Turkish lichenology has a relatively short history compared to Europe and America. In the last 30 years, however, numerous papers have been published, including checklists of several regions in Turkey (e.g., John 2007, Halıcı & Aksoy 2009, Kınalıoğlu 2010a, Şenkardeşler 2011, Yazıcı et al. 2013, Kocakaya et al. 2014). About 1300 species of lichenized fungi are known from Turkey, but unfortunately there is no checklist of the whole country. At least 2000 lichenized fungi are expected to occur in the country, considering its size, phytogeographical diversity, and different habitats (Halıcı et al. 2007). It is clear that the lichen biota is still far from being completely known in Turkey and that taxonomic studies focusing on genera or species complexes are needed.

The genus *Candelariella* includes species with 8- or polyspored asci of the *Lecanora*-type, biatorine or lecanorine apothecia, and a secondary chemistry with pulvinic acid and derivatives (Westberg 2005). Approximately 50 *Candelariella* species are known worldwide (Westberg 2004), and in Turkey 15 species—*C. aggregata* M. Westb., *C. antennaria* Räsänen, *C. athallina* (Wedd.) Du Rietz, *C. aurella* (Hoffm.) Zahlbr., *C. coralliza* (Nyl.) H. Magn., *C. kuusamoensis* Räsänen, *C. lutella* (Vain.) Räsänen, *C. medians* (Nyl.) A.L. Sm., *C. plumbea* Poelt & Vězda, *C. reflexa* (Nyl.) Lettau, *C. rosulans* (Müll. Arg.)

Zahlbr., *C. unilocularis* (Elenkin) Nimis, *C. viae-lacteae* G. Thor & V. Wirth, *C. vitellina* (Hoffm.) Müll. Arg., *C. xanthostigma* (Pers. ex Ach.) Lettau—have been reported (Breuss & John 2004; Candan & Türk 2008; Güvenç et al. 2006; Halıcı & Aksoy 2009; Halıcı & Güvenç 2008; Halıcı et al. 2013, 2014; Yazıcı et al. 2012). Here we report two new *Candelariella* species for Turkey.

The genus *Acrocordia* is characterized by cylindrical asci with an apparently unique apical structure and by uniseriate ellipsoid ascospores with a warted perispore (Smith et al. 2009). Five species—*Acrocordia cavata* (Ach.) R.C. Harris, *A. conoidea* (Fr.) Körb., *A. gemmata* (Ach.) A. Massal., *A. macrospora* A. Massal., *A. salweyi* (Nyl.) A.L. Sm.)—have been recorded in Turkey (Doğru & Güvenç 2007, Güvenç et al. 2006, Kınalıoğlu 2010b, Özdemir Türk & Güner 1998, Yazıcı & Aslan 2006, Yazıcı et al. 2007). Here we report one new *Acrocordia* species for Turkey.

Material & methods

The newly recorded specimens are deposited in Erciyes University Herbarium Kayseri, Turkey (EUH). They were examined by standard microscopic techniques. Hand-cut sections were studied in water, potassium hydroxide (KOH), and Lugol's solution (I). Measurements were made in water. Ascospores were measured from five different ascoma for each species. The measurements are given as minimum–maximum from N measurements. The descriptions summarized below for each species are based the Turkish specimens.

Taxonomy

Acrocordia subglobosa (Vězda) Poelt & Vězda, Biblioth. Lichenol. 9: 11 (1977)

FIGS 1A,B

A detailed description is provided by Poelt & Vězda (1977).

Thallus immersed to poorly developed, whitish. Perithecia 0.3–0.7 mm diam. (N = 10); involucrellum incurved around the exciple and continuous below, black, globose. Asci cylindrical, 120–156 × 10–14 µm. (N = 15), 8-spored, ascospores uniseriately arranged in the asci. Hamathecium of pseudoparaphyses that are not appreciably widened at the tips, 1.2–1.4 µm diam. Ascospores colourless, simple, 1-septate and with a warted perispore, broadly ellipsoid, 12–18 × 7–8.5 µm (N = 20).

SPECIMEN EXAMINED: **TURKEY**, **ZONGULDAK**, Kozlu, North of Eregli–Akcakoca highway, 41°25′26″N 31°43′11″E, alt. 0–10 m, coastal rocks, 27 July 2012, M.G. Halıcı (ERC MGH 4652).

The specimen was collected from coastal calcareous rocks in Turkey's western Black Sea Region; its ascospores are slightly longer and wider than those cited in the literature (Poelt & Vězda 1977, Smith et al. 2009, Pykälä 2008).

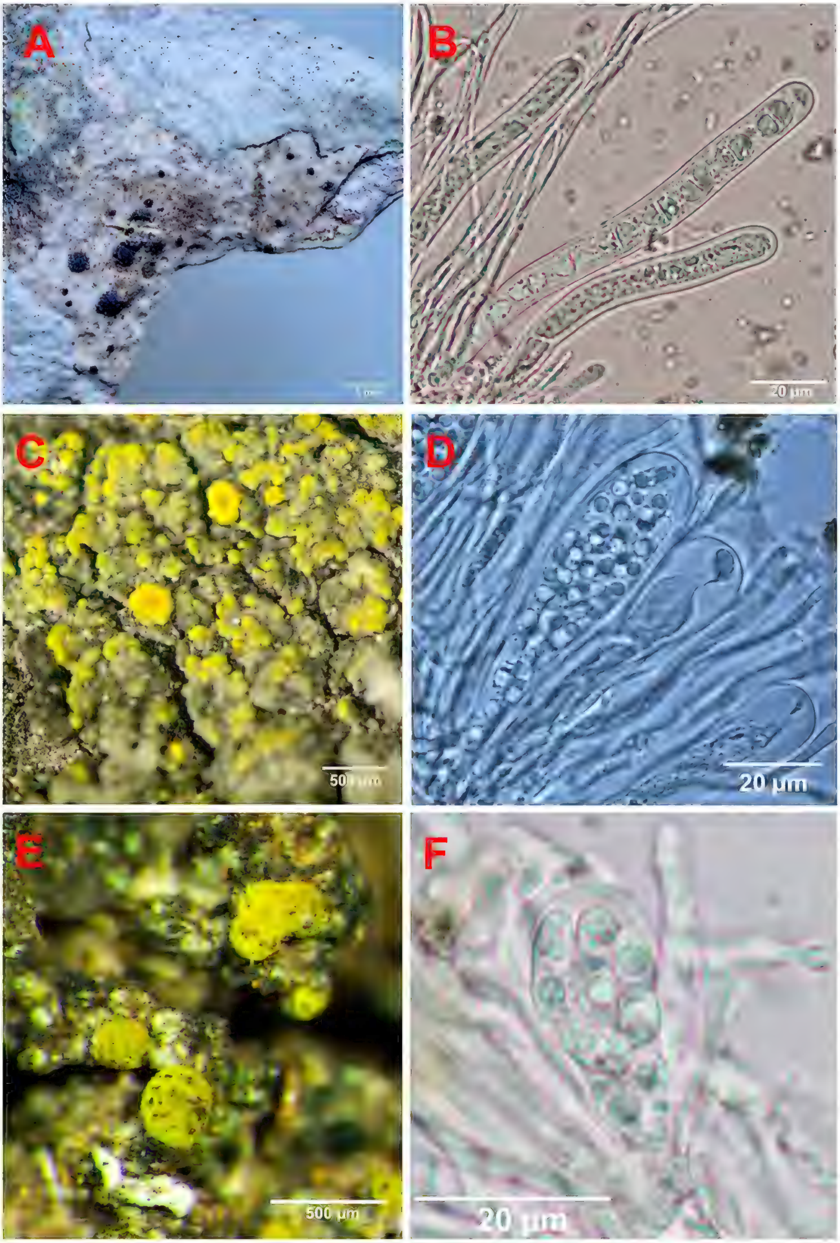

FIG. 1. ***Acrocordia subglobosa:*** A, thallus; B, ascus, ascospores, and pseudoparaphyses. ***Candelariella faginea:*** C, thallus; D, paraphyses and polyspored asci. ***Candelariella subdeflexa:*** E, thallus; F, paraphyses and 8-spored asci.

Acrocordia subglobosa is very similar to *A. salweyi*, differing mainly in its smaller perithecia and ascospores (Smith et al. 2009), and is known on calcareous rocks at 500 m from Scotland, Central Europe, Finland, and Ukraine (Smerechynska 2005, Pykälä 2008, Smith et al. 2009). New to Turkey.

Candelariella faginea Nimis, Poelt & Puntillo, Nova Hedwigia 49: 276 (1989)

Figs 1c,d

A detailed description is provided by Nimis et al. (1989).

Thallus areolate to subsquamulose; areoles grayish green in the center but yellowish green towards the margins; with blastidia. Apothecia common, lecanorine, disc greenish yellow and margin yellow, 0.2–0.4 mm diam. (N = 8). Hymenium colorless, 70–80 µm tall. Paraphyses simple. Asci clavate, polyspored, 65–80 × 20–29 µm (N = 10). Ascospores simple, narrowly ellipsoid, 13–16 × 4–6 µm (N = 15). Spot tests K–, KC–, C–.

Specimen Examined: TURKEY, İzmir, Bornova, northeast of Sancaklı, 38°31′13″N 27°11′35″E, alt. 700 m, on bark of *Quercus* sp., 30 June 2012, M.G. Halıcı (ERC CAN 0. 212).

Candelariella faginea has hitherto been reported on bark of deciduous trees (usually *Fagus*). The Turkish specimen was collected on *Quercus* bark in the Aegean part of Turkey where a Mediterranean climate prevails. It was accompanied by *Caloplaca monacensis* (Leder.) Lettau, *Lecidella elaeochroma* (Ach.) M. Choisy, *Lecanora hagenii* (Ach.) Ach., *Physconia* sp., and *Rinodina* sp.

Candelariella faginea differs from *C. xanthostigma* by its blastidiate thallus and areoles that are almost squamulose. *Candelariella coralliza* differs from *C. faginea* by its thallus composed of coralloid cylindrical granules forming compact cushions and also by substrate and general ecology (Nimis et al. 1989).

This species is mainly known from southern Europe (Italy, Spain, Greece) and Ukraine (Aragon & Martinez 2002, Khodosovtsev 2005, Spribille et al. 2006). New to Turkey.

Candelariella subdeflexa (Nyl.) Lettau, Hedwigia 52: 196 (1912) Figs 1e,f

A detailed description is provided by Westberg (2007).

Thallus squamulose, distinct, surface dirty gray, smooth. Apothecia biatorine, scattered, pale yellow to greenish yellow, 0.3–0.5 mm diam. (N = 10). Hymenium colorless, 50–60 µm tall. Paraphyses simple. Asci clavate, 8-spored, 38–45 × 13–19 µm (N = 15). Ascospores simple, narrowly ellipsoid, 9–4 × 4–5.5 µm (N = 20). Spot tests K–, KC–, C–.

Specimen Examined: TURKEY, Sivas, Gemerek, Sızır, 39°18’30”N 35°59’ 25”E, alt. 1250 m, on bark of *Quercus* sp., 3 October 2010, M.G. Halıcı & M. Kocakaya (ERC CAN 0.049).

The Turkish specimen was collected from Central Anatolia on the bark of *Quercus*. According to Westberg (2007), *C. subdeflexa* is a corticolous species growing mainly on the trunks of various deciduous trees such as *Populus*, *Quercus*, *Fraxinus*, and *Juniperus* and is characterized by its biatorine apothecia and gray squamulose thallus. The Turkish specimen agrees well with the description given in Westberg (2007).

This species has a bipolar distribution and is known from North America, Europe, North Africa, and New Zealand (Poelt & Vězda 1977; Nimis 1993; Galloway & Hafellner 2002; Westberg 2004, 2007; Westberg & Clerc 2012). New to Turkey.

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